Business & Enterprise Systems

Integrity - Service - Excellence

AF Systems Engineering Assessment Model (AF SEAM)

Self-Assessment Training

Current: 9 Jan 2015

Overview

- Training Objectives
- AF SEAM Overview and History
- AF SEAM Goals
- Policy
- AF SEAM Practices and Composition
- AF SEAM Assessment Process
- Self-Assessment Overview
- Self-Assessment Planning and Execution
- Answering Questions
- Scoring Methodology and Summaries
- Self-Assessment Reporting
- Next Steps…

Training Objectives

- **Objectives**
  - Provide an overview of model
  - Teach the self-assessment process
  - Facilitate understanding of the self-assessment tool
  - Introduce the validation assessment process
- **Preparation**
  - Review the model content, elements, and definitions
- **Expected Outcomes**
  - Understand the contents of the model and scoring methodology
  - Be able to develop quality self-assessment responses
  - Understand how to use the self-assessment tool
  - Awareness of the validation assessment process

What is AF SEAM?

- **Overview**
  - **Single AF-wide *process improvement tool* used for the assessment and improvement of systems engineering processes in a project or across an organization**
  - **Composite of industry and DoD best practices**
  - **Promotes consistent understanding/application of SE**
  - **Facilitates a gap analysis of an organization's SE processes**

- **History**
  - **Baseline released (August 2008) – Version 1.0**
  - **Became policy with AFMCI 63-1201 (October 2009)**
  - **Update released (September 2010) – Version 2.0**

Why We Need AF SEAM

- **Lack of disciplined system engineering application has been a major contributor to poor program performance**

- **Many problems have surfaced repeatedly with AF programs**
  - **Poor requirements development and management**
  - **Poor planning fundamentals**
  - **Lack of integrated risk and issue management**
  - **Lack of rigorous process application**
  - **Failure to deliver mission capabilities**

AF SEAM Goals

- **Ensure a consistent understanding of systems engineering**
- **Ensure core SE processes are in place and being practiced at the *program/project* level**
- **Document repeatable SE "Best Practices" across AF**
- **Identify opportunities for continuous Improvement**
- **Clarify roles and responsibilities**
- **Improve program performance & reduce risk**

- **AF SEAM is NOT an appraisal of product quality**
- **AF SEAM is NOT a report card on personnel or the**

AFMC Policy

- **AFMCI 63-1201, *Implementing OSS&E and Life Cycle Systems Engineering*, Change 2 (11 February 2011)**
  - *"Programs listed in the Air Force Systems Information Library (AFSIL) shall use AF SEAM as a self assessment tool to evaluate the organization's capability to perform SE processes. AF SEAM assessments shall be conducted annually." (Para 1.6)*
  - *"Organizations are encouraged to assess their programs managed under common processes within a single assessment. The assessment of common programs shall be at the organizational Division level or lower." (Para 1.6)*

BES Directorate Policy

- **AF PEO BES Policy:**
  - *ALL programs required to build a BPD Tailoring Worksheet (TWS) shall complete an AF SEAM Self-Assessment annually*
    - *FoS / SoS: If consolidated under a single TWS, perform a single AF SEAM Self-Assessment*
  - *Includes all ACAT and sustainment programs*

AF SEAM Pedigree

- **AF SEAM Foundation:**
  - **Capability Maturity Model Integration (CMMI®)**
  - **Defense Acquisition Guidebook (DAG)**
  - **AFI 63-1201 – *Life Cycle Systems Engineering***
  - **ANSI/EIA 632 – *Processes for Engineering a System***
  - **IEEE/EIA 731 – *Systems Engineering Capability Model***
  - **ISO/IEEE 15288 – *Systems Engineering-System Life Cycle Processes***
  - **INCOSE – *System Engineering Standards***

AF SEAM Practices

- **Specific Practices**
  - Unique to each process area
  - Informative Material
    - Description
    - Typical Work Products
    - Other Considerations
    - References
    - Local References

- **Generic Practices**
  - Same questions apply to all process areas
  - Informative Material
    - Description
    - Typical Work Products
  - Facilitates successful achievement of specific practices and process area goals

AF SEAM Practice Composition

Process Areas	Goals	Specific Practices	Generic Practices	Total Practices
Configuration Management (CM)	3	8	7	15
Decision Analysis (DA)	1	5	7	12
Design (D)	3	14	7	21
Manufacturing (M)	4	12	7	19
Project Planning (PP)	3	15	7	22
Requirements (R)	4	13	7	20
Risk Management (RM)	3	7	7	14
Transition, Fielding & Sustainment (TFS)	4	15	7	22
Tech Mgmt & Control (TMC)	4	15	7	22
V & V (V)	5	16	7	23
IA SE Integration (IA)	4	10	7	17
Totals:	*38*	*130*	*77*	*207*

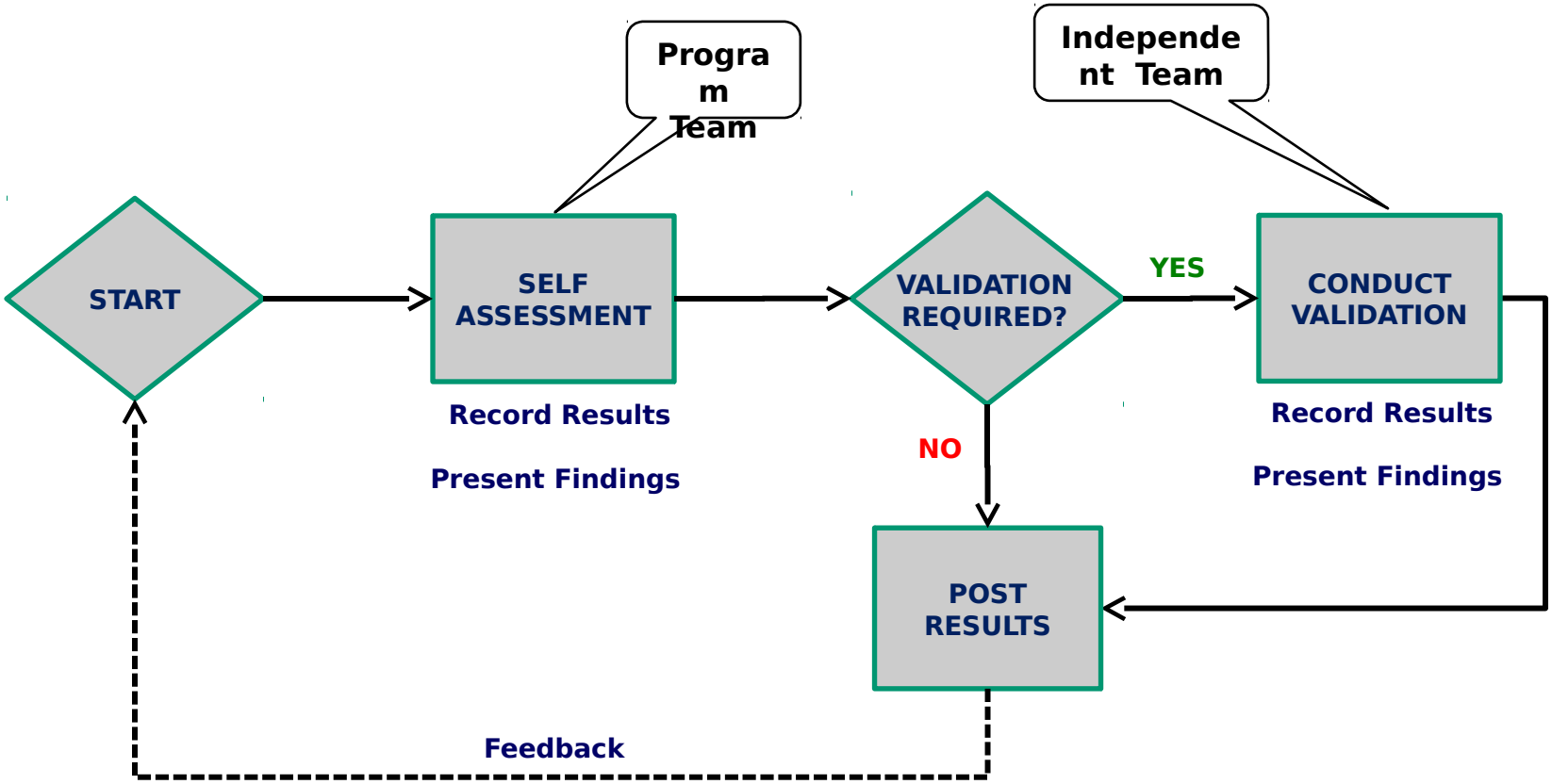
Sample Specific Practice

- **RMG1P1: Determine risk sources and categories**
- **Description: Establish categories of risks and risk sources for the project initially and refine the risk structure over time (e.g., schedule, cost, supplier execution, technology readiness, manufacturing readiness, product safety, and issues outside control of team), using Integrated Product Teams. Quantify the risk probability and consequence in terms of cost and schedule.**
- **Typical Work Products: Risk Management Plan; Risk Matrix**
- **Reference Material: DoD Risk Management Guide, AFI 90-901**
- **Other Considerations: Consider using Acquisition Center of Excellence Risk Management Workshops when needed. For manufacturing risks consider the**

Generic Practices

- **GP-1: Establish and maintain the description of a defined process**
- **GP-2: Establish and maintain plans for performing the process**
- **GP-3: Provide adequate resources for performing the process, developing the work products, and providing the services of the process**
- **GP-4: Assign responsibility and authority for performing the process, developing the work products, and providing the services of the process**
- **GP-5: Train the people performing or supporting the processes needed**
- **GP-6: Monitor and control the process**
- **GP-7: Review the activities, status, and results of the process with higher level management and resolve issues**

AF SEAM Assessment Process



U.S. AIR FORCE

Self-Assessment Overview

- **An AF SEAM Self-Assessment is conducted by Program/Project Personnel and matrix support personnel**

- **The Self-Assessment is an opportunity to:**
  - **Ensure existence of disciplined systems engineering processes; demonstrated ability to execute processes**
  - **Identify outputs (work products) from the process**
  - **Identify strengths / best practices exercised by programs/projects**
  - **Identify opportunities for program/project or process improvement**

Self-Assessment Preparation & Execution

- **Plan**
  - **BPD Procedure: QAPR005 – AF SEAM Self-Assessment**
  - **Scope the Self-Assessment effort**
    - **Identify and allocate resources to each process area; this is a TEAM effort (not just engineering) – the PM is ultimately responsible for the assessment**
    - **Schedule Self-Assessment Team Training**
  - **Schedule Self-Assessment activities**
- **Execute Self-Assessment**
  - **Teams self-assess each assigned area and record results on the AF SEAM Assessment Tool (AFSAT) spreadsheet**
    - **Select the appropriate score and enter a concise explanation of the rationale for the rating**
    - **Provide a storage location / link to the artifacts that satisfy the score**
    - **Enter the POC for each item assessed**
    - **Document any program/project strengths and/or opportunities for improvement**

Scoring Methodology

- **Compare your process (how you do things) to the practice (a process standard, or what should be done) and answer…**
  - **(1) = YES – if your process completely satisfies the practice**
  - **(0) = NO – if your process does not satisfy or partially satisfies the practice (Give yourself partial credit in the explanation.)**
  - **N/A – if the practice does not apply either by uniqueness of the program, timing, or other circumstances**
  - **Be prepared to defend N/A answers**

Answering Questions…

- **Make honest assessments of each practice**
  - **Use your TWS to help score and answer practice area questions**
- **Do not simply score questions YES / NO / N/A without detailed responses to each question**
  - **Provide concise explanations of how you meet the practice, don't meet the practice, or why the practice does not apply**
  - **Providing explanations helps formulate strengths and opportunities to improve process; data will be used in the final report**
  - **RECOMMENDED ACTION: restate the question as part of your response**
- **Only score YES if you fully comply with the practice**
  - **If you partially meet the practice but have an opportunity to improve, score as NO and explain your improvement/get-well plan**

U.S. AIR FORCE

Answering Questions…

- **Document Strengths and Improvement Opportunities in the appropriate tab on the AFSAT Tool**
- **Answers should be congruent with UCI/SIP responses**
  - **Debate continues concerning duplicative processes/products**

AFSAT Sample

U.S. AIR FORCE

SG ID	AF SEAM Specific Goal (SG) Title	AF SEAM Specific Practice ID	AF SEAM Specific Practice (SP)	Description	Typical Work Products
CMG1	*The approach for technical baseline management is defined and documented.*				
		CMG1P1	Identify accountability for the disposition of, access to, release of and control of the technical baselines.	Establish and maintain a strategy for technical baseline management. Specify which configuration items will be controlled during the various phases of product development (i.e., what baselines will be established and when). Define the membership of the configuration control boards. Define which members will have authority to access and release design and product baselines, and authorize changes to the baselines as the product progresses through its life cycle.	(1) Systems Engineering Plan (SEP) (2) Configuration Control Board (CCB) Charter

SELECT FROM LIST OF VALUES 1, 0, or N/A →

SELF ASSESSMENT			
Score (0, 1, or N/A)	Yes: Provide a concise explanation of how; No or N/A: Provide explanation why not.	Title, version, date, and ideally a link for any associated work products developed.	Program/Project POC

U.S. AIR FORCE

AFSAT Sample (Cont'd)

Self-Assessment Strengths & Improvement Opportunities					
Process Area	Practice ID	Strength	Improvement Opportunities	Get-Well Plan	OPR

U.S. AIR FORCE

Specific Practices Summary

Self-Assessment SP Profile

Program/Project Name:
Date:

LEGEND
90-100%
65-89%
0-64%
Not Applicable / Tailored
Not Used

% of Scored	71%	80%	82%	100%	100%	64%	54%	100%	67%	75%	
Specific Goal 1	**CM**	**DA**	**D**	**IA**	**M**	**PP**	**R**	**RM**	**TFS**	**TMC**	**V**
SP 1.1	1	1	0	1	N/A	0	1	1	1	1	
SP 1.2	1	1	1		N/A	0	1	1	0	0	
SP 1.3		1	1		N/A	0	1	1	1	1	
SP 1.4		1	1			1	0			0	
SP 1.5		0	1								
Specific Goal 2	**CM**	**DA**	**D**	**IA**	**M**	**PP**	**R**	**RM**	**TFS**	**TMC**	**V**
SP 2.1	1		N/A	1	N/A	1	1	1	0	N/A	
SP 2.2	1		N/A		N/A	1	1	1	0	N/A	
SP 2.3	0		1		N/A	N/A			0	N/A	
SP 2.4	0		1			N/A			1	N/A	
SP 2.5						N/A			1	1	
SP 2.6						1					
SP 2.7						N/A					
SP 2.8						1					
Specfic Goal 3	**CM**	**DA**	**D**	**IA**	**M**	**PP**	**R**	**RM**	**TFS**	**TMC**	**V**
SP 3.1	N/A		0	1	N/A	0	1	1	1	1	
SP 3.2	1		1	1	N/A	1	1	1	1	1	
SP 3.3			1	1	N/A	1	0			1	
SP 3.4			1								
SP 3.5			N/A								
Specific Goal 4	**CM**	**DA**	**D**	**IA**	**M**	**PP**	**R**	**RM**	**TFS**	**TMC**	**V**
SP 4.1				1	N/A		0		N/A		
SP 4.2				1	1		0		N/A		
SP 4.3				1	N/A		0		N/A		
SP 4.4				1			0		1		N/A
SP 4.5				1					1		
Specific Goal 5	**CM**	**DA**	**D**	**IA**	**M**	**PP**	**R**	**RM**	**TFS**	**TMC**	**V**
SP 5.1											
SP 5.2											

U.S. AIR FORCE

Generic Practices Summary

Self-Assessment GP Scoresheet

Program/Project Name:

Date:

PA/GP	GP1	GP2	GP3	GP4	GP5	GP6	GP7	GP Overall
CM								4
DA								3
D								7
IA								7
M	N/A	N/A		N/A	N/A	N/A	N/A	0
PP								7
R								3
RM								7
TFS								2
TMC	N/A	N/A	N/A	N/A				2
V								

NOTE: GP Overall Score color is based on the number of GPs assessed as being accomplished. Scores: 0-3 (Red), 4-5 (Yellow), and 6-7 (Green).

N/A = Recommended organizational tailoring

Combined Summary

U.S. AIR FORCE

Briefing Slide Templates

Specific Practices	CM	DA	D	IA	M	PP	R	RM	TFS	TMC	V
Self-Assessment Score	71%	80%	82%	100%	100%	64%	54%	100%	67%	75%	
Validation Assessment Score											

Generic Practices	CM	DA	D	IA	M	PP	R	RM	TFS	TMC	V
Self-Assessment Score	4	3	7	7	0	7	3	7	2	2	
Validation Assessment Score											

	Self-Assessment		Validation	
	SP	GP	SP	GP
Configuration Management	71%	4		
Decision Analysis	80%	3		
Design	82%	7		
Info Assurance & Sys. Eng Integration	100%	7		
Manufacturing	100%	0		
Project Planning	64%	7		
Requirements	54%	3		
Risk Management	100%	7		
Transition, Fielding, & Sustainment	67%	2		
Technical Management & Control	75%	2		
Verification & Validation				

GP Scoring:	
0-3	
4-5	
6-7	

SP Scoring:	
90-100%	
65-89%	
0-64%	

U.S. AIR FORCE

What's Next?

- Review each N/A score for reasonableness
- Prioritize each NO score into one of four categories
  - Compliance item – we must do this
  - Adds great value to program – we're going to do this
  - Adds value – we'd like to do this but we do not have enough resources
  - No or little value – we are not going to do this (now or later) because it brings little or no value; document
- Each NO item should generate a program risk or action item
  - Build plan to address highest priority items

Self-Assessment Reporting

- **Brief Branch/Division Leadership using AFSAT Tool Summaries**
  - **Highlight program strengths and improvement opportunities**
  - **Review risks generated for practices scored “NO”**
- **Submit completed AFSAT Tool to PIB @ Gunter.AF.Mil**
  - **Import into SharePoint instance?**
  - **Consolidate BES Directorate inputs**
    - **Identify systemic and organizational strengths / improvement opportunities**
    - **Analyze / implement organizational process changes necessary**
    - **Brief the PEO and Senior Staff on organizational**

U.S. AIR FORCE

Summary

- **AF SEAM was designed to:**
  - **Promote consistent understanding/application of Systems Engineering Discipline**
  - **Facilitate Continuous Process Improvement (CPI) – at the program and organizational levels**
  - **Ultimately – Improve Program Performance**
- **Understanding the AF SEAM Model and Methodology is imperative to performing the self assessment**
- **AF SEAM Assessments are a <u>TEAM</u> effort; all members of the program team must work collaboratively for assessments to be a success – that efforts leads to improved program performance**

Recap and Feedback

- **Do you have any unanswered questions?**
- **Did we meet the objectives as stated?**
- **Don’t forget to request your CLPs!**
- **Please fill out a critique so we can improve this class for those who may attend in the future; written suggestions are very helpful**